Overview

Efficient use of materials is most important today for all technological sectors today to maintain sustainability and competitiveness. Proper selection of materials for all engineering design is a key aspect for increased energy efficiency, environmental protection, and preserving scarce resources. Typical examples are weight reduction in automotive and aerospace, and information technology for which high performing electronic materials and multi-material systems drive miniaturization, while increasing the capability for information storage and communication.

The number of materials available for a materials engineer today is huge, and therefore material selection needs to be based on proper understanding of the material properties and connection to microstructure, process characteristics, and resulting performance. Use of material property charts allow visualization and comparison of materials’ properties, while the use of materials indices related to the various products design provides easy correlation and selection of materials. This course will focus on developing a material selection methodology based on material indices and material property charts (constructed using Cambridge Engineering Selector (CES) material data base) and materials related lectures depicting the state-of-the-art materials use in various engineering sectors for both to understand the reason behind the present application, problems and the possibility of improving performance by use of new materials as replacements.

This approach will provide students a holistic view of materials properties, performance, and applications, while a deeper correlation to the reason for various properties are analysed in terms of structure and connection to process.

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<th>Modules</th>
<th>A: Advanced materials and applications today: July 11 - July 12, 2016</th>
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<tr>
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<td>B: Material selection for various applications: July 13 – July 14, 2016</td>
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<td>C: Short projects on material selection: July 15, 2016</td>
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<td>Number of participants for the course will be limited to fifty.</td>
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You Should Attend If you are

- an Engineer / Researcher in materials engineering from a government organization and company including R&D laboratory.
- a student at any level (BTech/MSc/MTech/PhD) or an interested faculty from an academic institution / technical institution.

Fees

The participation fee for taking the course is as follows:

Participants from abroad: US $500  
Industry/ Research Organizations: INR 30000  
Academic Institutions: INR 10000  

The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.
The Faculty

**Professor Rajan Ambat** is Professor in Corrosion and Surface Engineering at Section of Materials and Surface Engineering, Department of Mechanical Engineering, Technical University of Denmark. He teaches courses at master level covering advanced materials selection and surface engineering. Professor Ambat has over 20 years of teaching and research expertise in materials, corrosion, and surface engineering issues. His research interests currently focus on corrosion at micro- and nano-scale, corrosion assisted fracture, environmental reliability of electronics and MEMs, nanoscale surface modification of aluminium alloys, and functionalized surface on aluminium alloys. He has more than 170 publications. He has been part of a number of European research and teaching activities including visiting professorship at University of Lille, France in 2014. He is presently managing a Centre and Industrial Consortium in the area of Climatic reliability of Electronics at DTU. He is chairman for the Task Force on “Corrosion reliability of electronic devices” under European Federation of Corrosion as well as in the editorial board of journals.

Course Co-ordinator

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